

## Standards Alignment

BlocksCAD supports zSpace’s CTE and STEM curriculum through alignment with the [youscience exams and standards](#). All BlocksCAD building promotes spatial reasoning skills, design thinking, numerical fluency, and coding best practices. Certain BlocksCAD lessons explicitly address field-specific standards, documented below.

### STEM Career Cluster:

#### 3D Animation and 3D Graphics

<p><b>Standard 1:</b> Students will identify career opportunities available within 3D Graphics and Animation.</p>	<p>BlocksCAD projects introduce students to character and object design using 3D shapes and tools.</p>
<p><b>Standard 2:</b> Students will understand and utilize 3D software tools and interface.</p>	<p>BlocksCAD is an easy platform to learn, but includes significant depth and rigor that will prepare students to use other platforms in the future.</p>

#### Biotechnology

<p><b>Standard 5:</b> Students will describe the structure and function of cells and their components.</p>	<p>Build a model of a cell or of a particular organelle. Another popular BlocksCAD project is designing an atom for a particular element.</p>
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#### CAD Architectural Design I

<p><b>Standard 1:</b> Students will investigate architecture, engineering, and construction (AEC) related career opportunities.</p>	<p>BlocksCAD shows students how early-stage architectural planning can work and many projects put students in the role of specific engineering professions.</p>
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<b>Standard 2:</b> Students will be able to understand, demonstrate, and apply mathematics and measuring skills.	BlocksCAD is an inherently mathematical platform, and all building that students do will require calculation, measurement, and numerical fluency.
<b>Standard 4:</b> Students will be able to demonstrate sketching and CAD drawing techniques.	Many projects encourage sketching or drafting before then turning those ideas into CAD projects.

## CAD Architectural Design II

<b>Standard 1:</b> Students will be able to understand architectural design fundamentals	Several BlocksCAD projects explore architectural themes, and any 3D printing project requires that students think about the structure and setup of their project.
<b>Standard 2:</b> Students will be able to understand room and space planning.	In the Model Home and Furniture Lessons students design and build the interior and exterior of potential living spaces.

## CAD Mechanical Design I

<b>Standard 1:</b> Students will investigate career opportunities in engineering and engineering technology	Many BlocksCAD projects ask students to step into specific career roles for the theme of the project.
<b>Standard 2:</b> Students will understand the elements of an organized approach to solving an engineering design problem	BlocksCAD projects all include organized steps that help students think of, build, and iterate their designs.
<b>Standard 3:</b> Students will document the design process and communicate the result of that process using appropriate techniques	The code-labeling feature in BlocksCAD gives students the opportunity to document their building process and communicate their organization to others.
<b>Standard 4:</b> Students will understand and apply mathematics, measuring conventions, and scale	The BlocksCAD axes and blocks are all on a millimeter scale, so every operation students perform to shapes requires math and measurement.

<b>Standard 5:</b> Students will be able to develop orthographic views of a part with the correct dimensions and geometry	The 3D environment of BlocksCAD helps students quickly manipulate 3D shapes and view their creations from all different angles.
<b>Standard 8:</b> Students will be able to understand and use 2d computer software to create technical drawings	BlocksCAD's 2D shapes allow for drafting and design in the 2D plane.

## CAD Mechanical Design II

<b>Standard 6:</b> Students will be able to understand and use 3D computer software to create technical drawings	All BlocksCAD projects require the 3D design skills essential for successful technical drawings.
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## Computer Science Principles

<b>Standard 1: <i>Creative Development</i></b> Collaboration is crucial when developing computing innovations, because having multiple perspectives offers additional opportunities to find solutions.	BlocksCAD is a project-based learning platform that encourages and facilitates collaboration and code-sharing so that students and learn from one another as they build.
<b>Standard 3: <i>Algorithms and Programming</i></b> Algorithms and programming languages are essential for solving problems and completing tasks.	BlocksCAD introduces students to coding best-practices and computer science tools such as loops, logic, modules, and variables.

## Engineering Principles I

<b>Standard 2:</b> Students will investigate career opportunities within the world of Engineering	Many BlocksCAD projects introduce students to professions in the engineering world.
<b>Standard 3:</b> Students will understand and develop positive work ethics,	Building in BlocksCAD requires planning, patience, communication, documentation, and collaboration.

communication skills, and leadership skills	
<b>Standard 4:</b> Students will identify the qualities of successful engineering design, recognize its role in society, and develop projects using an engineering design process	All projects in BlocksCAD require employing an engineering design process and many specific lessons explore the role engineering can play in society.
<b>Standard 7:</b> Students will understand ways in which Bioengineering can enhance the lives of individuals	Several BlocksCAD projects explore how engineering principles operate in the context of biology and the natural world.

## Engineering Principles II

<b>Standard 2:</b> Students will investigate career opportunities within the world of Engineering	Many BlocksCAD projects introduce students to professions in the engineering world.
<b>Standard 3:</b> Students will understand and develop positive work ethics, communication skills, and leadership skills	Building in BlocksCAD requires planning, patience, communication, documentation, and collaboration.
<b>Standard 7:</b> Students will understand ways in which Materials Science can enhance health and well-being of individuals	Several projects in the BlocksCAD curriculum introduce students to ways in which materials science and manufacturing can produce objects that benefit individuals or society.
<b>Standard 8:</b> Students will understand ways in which Mechanical Engineering can enhance the lives of individuals	

## Engineering Technology

<b>Standard 2:</b> Students will develop an engineering mindset	All BlocksCAD projects require students to adopt an engineering mindset so that they can plan,
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<b>Standard 3:</b> Students will apply the elements of an engineering design process to create a product or system	build, and iterate their 3D models.
<b>Standard 5:</b> Students will apply engineering fundamentals	
<b>Standard 6:</b> Students will investigate future training opportunities and careers in engineering	Many BlocksCAD projects introduce students to professions in the engineering world.

## Exploring Computer Science

<p><b>Standard 1:</b> <i>Computer Science Principles</i></p> <p>Students will employ the following practices throughout the course. They provide a framework and serve as helpful reminders of the high-level skills and dispositions computer scientists should be continually developing.</p>	Building in BlocksCAD requires coding best-practices such as organization and documentation. The CS blocks such as loops and modules introduce students to specific concepts and principles essential to CS.
<p><b>Standard 2:</b> <i>Problem Solving with Computers</i></p> <p>Students will learn how computers input, output, store, and process information. Students will gain the importance of solving problems, and/or automating tasks with the aid of computers, as well as a basic understanding of the algorithms computers use.</p>	Using tools such as variables, modules, and loops in BlocksCAD teaches students how the platform can hold and manipulate information in the context of a 3D design.
<p><b>Standard 4:</b> <i>Programming and Algorithms</i></p> <p>Students will understand that an algorithm is a sequence of steps designed to accomplish a specific task. Algorithms are then translated into</p>	The use of loops, modules, and variables in BlocksCAD helps students apply algorithmic

<p>programs, or code, to provide instructions for computing devices. Programs control all computing systems and empower people to communicate with the world in new ways and solve compelling problems.</p>	<p>sequences to a specific design goal. The 3D output lets them visually understand what these tools are doing.</p>
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## Manufacturing Principles I

<p><b>Standard 2:</b> Students will develop and practice fundamental habits and skills required in the 21st century workplace</p>	<p>The organization, idea-testing, communication, and patience required for BlocksCAD all prepare students for the modern work place.</p>
<p><b>Standard 5:</b> Students will be able to describe basic lean manufacturing principles and the appropriate practices to apply in response to specific problems</p>	<p>Most BlocksCAD projects ask students to consider a specific goal or problem and design a 3D object to meet certain needs.</p>

## Manufacturing Technology

<p><b>Standard 3:</b> Students will develop an understand of and be able to select and use appropriate manufacturing technologies</p>	<p>All BlocksCAD projects introduce students to early steps in the manufacturing process and any 3D printing projects require students to work with digital fabrication too.</p>
<p><b>Standard 6:</b> Students will investigate the educational pathways and career opportunities in the manufacturing industry</p>	<p>Many BlocksCAD projects ask students to consider the professional roles that use manufacturing.</p>

## Arts, A/V Technology & Communications

### 3D Animation

<b>Standard 1:</b> Students will identify career opportunities available within 3D Graphics and Animation	BlocksCAD projects introduce students to character and object design using 3D shapes and tools.
<b>Standard 2:</b> Students will understand and utilize 3D software tools and interface	BlocksCAD is an easy platform to learn, but includes significant depth and rigor that will prepare students to use other platforms in the future.

## 3D Graphics

<b>Standard 1:</b> Students will identify the career opportunities available within 3D graphics and animation	BlocksCAD projects introduce students to character and object design using 3D shapes and tools.
<b>Standard 2:</b> Students will understand and utilize 3D software tools and interface	BlocksCAD is an easy platform to learn, but includes significant depth and rigor that will prepare students to use other platforms in the future.
<b>Standard 3:</b> Students will be able to model a 3D polygonal object	Every BlocksCAD project involves creating a 3D object out of component shapes.

## Digital Graphic Arts I

<b>Standard 2:</b> Students will be able to understand the design process	The design process is essential to every BlocksCAD build.
<b>Standard 4:</b> Students will be able to understand and demonstrate digital illustrations	All 3D designs in BlocksCAD are examples of digital illustrations.
<b>Standard 6:</b> Students will be able to perform relevant computer functions on any standard platform (Windows, Mac, Linux)	BlocksCAD develops transferable computer skills.
<b>Standard 7:</b> Students will explore career opportunities and demonstrate understanding of employability competencies	BlocksCAD projects provide many examples of careers in the digital graphic arts.

## Digital Graphic Arts II

<b>Standard 3:</b> Students will be able to understand and demonstrate design processes	Every BlocksCAD process relies on the digital design process.
<b>Standard 4:</b> Students will be able to understand and demonstrate computer skills	Making and manipulating projects in BlocksCAD requires and advances students' computer skills.

## Digital Graphic Arts III

<b>Standard 4:</b> Students will understand and demonstrate measuring problems	The millimeter axes of BlocksCAD's building platform make every project an exercise in math and measurement.
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## Digital Media IA

<b>Standard 2:</b> Students will be able to demonstrate the ability to perform relevant computer functions on a standard platform (PC, MAC, Linux) as they apply to digital media while using 21st century skills	Making and manipulating projects in BlocksCAD requires and advances students' computer skills.
<b>Standard 3:</b> Students will recognize and apply effective visual design concepts	Students employ visual design concepts in BlocksCAD when picking the shapes and colors that they use for their projects.
<b>Standard 5:</b> Students will explore new and digital technologies	BlocksCAD is an innovative new digital technology that facilitates 3D design.

## Digital Media IB

<b>Standard 1:</b> Students will demonstrate proper planning and design by utilizing an instruction design model such as	Planning, design, and iteration are essential parts of the BlocksCAD building process.
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addie, adobe professional design, rapid deployment model, and so forth in the development of digital media projects	
<b>Standard 5:</b> Students will participate in individual and team (group) activities	Collaborative BlocksCAD projects facilitate communication and teamwork among students who can share code or combine their 3D designs into one larger project.
<b>Standard 6:</b> Students will design and develop various projects to add to a digital portfolio	BlocksCAD accounts save student work into a digital portfolio of their 3D designs.

## Digital Media II

<b>Standard 1:</b> Students will use and enhance skills learned in digital media design	BlocksCAD's curriculum progressively builds digital and design skills.
<b>Standard 2:</b> Students will create a 3D graphic and be introduced to animation	All building in BlocksCAD introduces students to 3D graphic design.
<b>Standard 4:</b> Students will develop interactive media projects working on a team or as an individual (one project will be in a computer-based [CB] or web-based [WB] format. The other three projects will be student designed projects.)	BlocksCAD is a project-based learning platform where students can work in a team to collectively design a digital 3D creation.
<b>Standard 5:</b> Students will create an interactive digital media portfolio for digital delivery which showcases a student's projects, work, and skills. Projects included can be created individually or as a team member	BlocksCAD accounts save student work into a digital portfolio of their 3D designs.
<b>Standard 6:</b> Students will participate in a work-based learning experience and/or student competition.	BlocksCAD hosts building competitions and teachers can host their own by evaluating student work from their saved portfolios against some criteria.

## Interior Design I

<b>Standard 1:</b> Students will demonstrate professional design presentation	Part of the BlocksCAD building process is creatively using color to enhance designs.
<b>Standard 3:</b> Students will identify and explain the basic elements of design or “tools” used to create a design: line, shape, form, space, texture, pattern, and color	BlocksCAD projects require students to make choices about the shapes, forms, and colors that they choose to use.
<b>Standard 4:</b> Students will identify the terms associated with the color wheel and the major color schemes.	Students can use multiple different BlocksCAD color schemes to enhance their designs.

## Interior Design II

<b>Standard 2:</b> Students will distinguish features of selected furniture styles and characteristics.	In the Furniture BlocksCAD lesson students design and build their own model furniture for a room.
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## Interior Design III

<b>Standard 1:</b> Students will analyze careers and explore the design industry	Several BlocksCAD projects introduce students to careers in design.
<b>Standard 4:</b> Students will identify technology and other industry skills used in interior design documentation and presentations	BlocksCAD is an example of a 3D design tool that would support an interior designer preparing a presentation of model furniture.

## Architecture & Construction

### CAD Architectural Design I

<b>Standard 1:</b> Students will investigate architecture, engineering, and construction (AEC) related career opportunities	Many BlocksCAD projects introduce students to specific roles and functions in AEC fields.
<b>Standard 2:</b> Students will be able to understand, demonstrate, and apply mathematics and measuring skills	The BlocksCAD axes and blocks are all on a millimeter scale, so every operation students perform to shapes requires math and measurement.
<b>Standard 4:</b> Students will be able to demonstrate sketching and CAD drawing techniques.	All BlocksCAD projects require students to employ and demonstrate CAD techniques.

## CAD Architectural Design II

<b>Standard 1:</b> Students will be able to understand architectural design fundamentals.	Several BlocksCAD projects explore architectural themes, and any 3D printing projects require that students think about the structure and setup of their project.
<b>Standard 2:</b> Students will be able to understand room and space planning.	In the Model Home and Furniture Lessons students design and build the interior and exterior of potential living spaces.

## CAD Mechanical Design I

<b>Standard 1:</b> Students will investigate career opportunities in engineering and engineering technology	Many BlocksCAD projects introduce students to specific careers in engineering.
<b>Standard 2:</b> Students will understand the elements of an organized approach to solving an engineering design problem	Every BlocksCAD project requires an organized approach to building in response to an engineering design problem.
<b>Standard 3:</b> Students will document the design process and communicate the result of that process using appropriate techniques	Code-labeling in BlocksCAD enables students to document and communicate their engineering and reasoning.

<b>Standard 4:</b> Students will understand and apply mathematics, measuring conventions, and scale	The BlocksCAD axes and blocks are all on a millimeter scale, so every operation students perform to shapes requires math and measurement.
<b>Standard 5:</b> Students will be able to develop orthographic views of a part with the correct dimensions and geometry	The 3D environment of BlocksCAD helps students quickly manipulate 3D shapes and view their creations from all different angles.
<b>Standard 8:</b> Students will be able to understand and use 2d computer software to create technical drawings	BlocksCAD 2D blocks allow students to build and draft in the 2D plane.

## CAD Mechanical Design II

<b>Standard 1:</b> Students will understand and apply mathematics, measuring conventions, and scale	The BlocksCAD axes and blocks are all on a millimeter scale, so every operation students perform to shapes requires math and measurement.
<b>Standard 2:</b> Students will be able to create a 3D part model with the correct dimensional and geometric sizes and constraints	Every BlocksCAD project requires using math and geometry to build an appropriate 3D model.
<b>Standard 6:</b> Students will be able to understand and use 3d computer software to create technical drawings	All BlocksCAD projects require the 3D design skills essential for successful technical drawings.

## Commercial Art III

<b>Standard 2:</b> Students will understand and be able to apply the design process to products and systems	All BlocksCAD projects require applying a design or engineering process to the development of some 3D product.
<b>Standard 3:</b> Students will be able to demonstrate knowledge of design elements and principles in solving simple industrial design problems	All BlocksCAD projects require students to employ design skills to solve a problem.

<b>Standard 4:</b> Students will be able to demonstrate knowledge of human factors related to design	Many BlocksCAD projects ask students to consider and incorporate human needs into their 3D designs.
<b>Standard 5:</b> Students will be able to conceive and create a product	All BlocksCAD projects involve students designing and then building a product.
<b>Standard 6:</b> Students will understand and demonstrate the ability to present ideas	BlocksCAD projects are all saved to a student's account where they can be shared to the class or in a small group
<b>Standard 7:</b> Students will demonstrate knowledge and use of computer technology	All BlocksCAD building develops computer technology skills.

## [Engineering Principles I](#) and [Engineering Principles II](#)

<b>Standard 2:</b> Students will investigate career opportunities within the world of Engineering	Many BlocksCAD projects introduce students to professions in the engineering world.
<b>Standard 3:</b> Students will understand and develop positive work ethics, communication skills, and leadership skills	Building in BlocksCAD requires planning, patience, communication, documentation, and collaboration.
<b>Standard 4:</b> Students will identify the qualities of successful engineering design, recognize its role in society, and develop projects using an engineering design process	All BlocksCAD projects require an engineering design process and many involve discussing engineering in the context of some societal need.

## [Engineering Technology](#)

<b>Standard 2:</b> Students will develop an engineering mindset	All BlocksCAD projects require students to adopt an engineering mindset so that they can plan,
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<b>Standard 3:</b> Students will apply the elements of an engineering design process to create a product or system	build, and iterate their 3D models.
<b>Standard 4:</b> Students will develop an understanding of the cultural, environmental, economic, and political effects of engineering, and the impacts of technology throughout history	Many BlocksCAD projects contextualize engineering with some societal or cultural need.
<b>Standard 5:</b> Students will apply engineering fundamentals	All BlocksCAD projects require students to employ engineering fundamentals.
<b>Standard 6:</b> Students will investigate future training opportunities and careers in engineering	Many BlocksCAD projects introduce students to specific careers in engineering.

## [Agriculture, Food and Natural Resources](#)

### [Agricultural Biology](#)

<b>Standard 4:</b> Students will understand that genetic information coded in DNA is passed from parents of offspring by sexual and asexual reproduction. The basic structure of DNA is the same in all living things. Changes in DNA may alter genetic expression.	An advanced project in BlocksCAD is to design the helical structure of DNA.
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### [Agricultural Science I](#)

<b>Standard 4:</b> Students will explain basic principles of agricultural science	Several BlocksCAD projects relate to animals, agriculture, and the environment.
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### [Agricultural Science II](#)

<b>Standard 11:</b> Students will demonstrate computer application skills.	Several BlocksCAD projects relate to animals, agriculture, and the environment.
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## Biotechnology

<b>Standard 1:</b> Students will investigate the past, present, and future applications of biotechnology as well as relevant careers.	In several BlocksCAD projects students consider how to design 3D objects related to health and biotechnology.
<b>Standard 4:</b> Students will describe the properties of atoms and molecules and prepare lab reagents.	BlocksCAD can be used to model cells, organelles, or atoms and explore how their form determines their function.
<b>Standard 5:</b> Students will describe the structure and function of cells and their components	

## Information Technology

See standards alignment above for 3D Animation, 3D Graphics, Computer Programming, Computer Science Principles, and Digital Media.